

Safety & Aesthetics in Urban Roadway Design



What happens when WSDOT and a
Local Agency don't see "eye to eye" on a
"Main Street" / "State Highway" project?

Who's Who

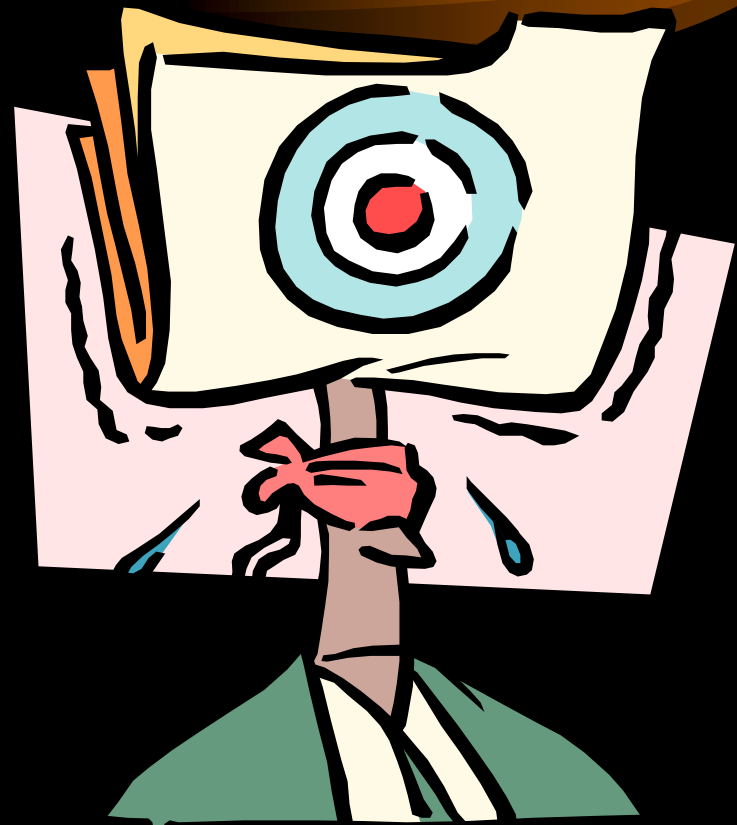


- Al King, P.E.
H&LP, WSDOT
- John Milton, P.E.
Design, WSDOT

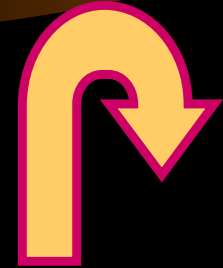
Washington State Association of County Engineers
April 2002
Orcas Island, Washington

Presentation Target

- Educational Effort
- Overview of Issue
- Interdisciplinary Group
- Sub Groups
- Participation
- Feedback



What is This?



- Street Trees
on State Highways!?
- Channelization & Access Control
- Local Agency Projects on State Highways
 - Old Highway 99
- Whose Needs Are We Meeting?
- What is the Purpose of the Roadway?

Goal

- To Provide Information About the Issues in Local Street / State Highway Design
- Give You Perspectives on the Issues
- Give You a Picture of the Path to Resolution



Why Do Counties Care?



- Numerous Overlapping Issues
- Counties Also Have Urban Areas
- Cost Sharing is an Issue
- Design Standards should reflect Facility Use, not Jurisdiction
- The Process Will Affect Standards

Issues

- Community Viewscapes / Roadway Safety
- Traffic Capacity / Calming
- Pedestrians / Autos
- **State / Local Standards**
- Shoulder / Median Clear Zones
- Liability –Manage or Avoid?



Resolution Path



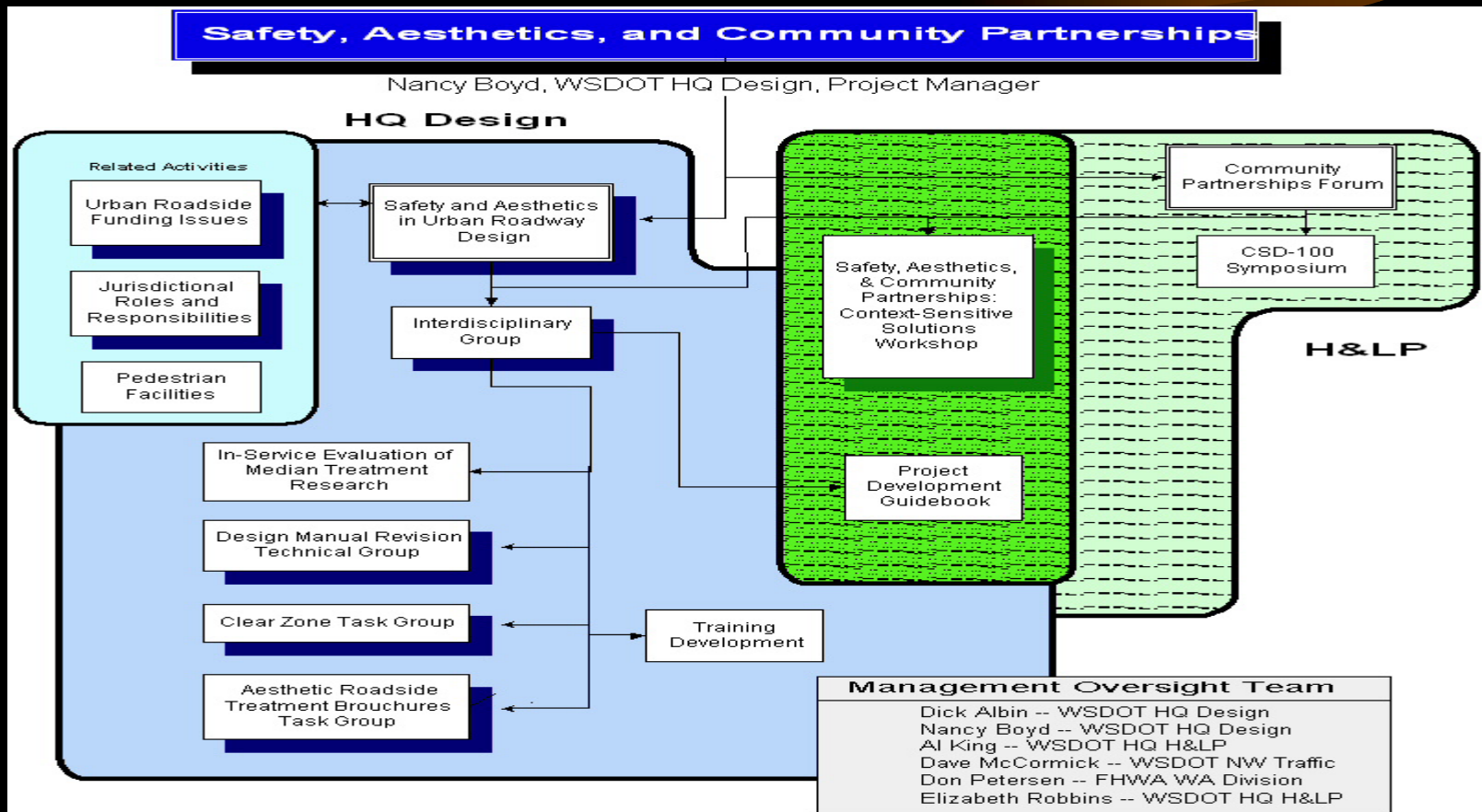
- Safety & Aesthetics Interdisciplinary Group
- Community Partnership Forum
- Internal WSDOT Discussions
- In-Service Evaluations
- **Local Agency Design Standards Committee**
- **Local Agency Guidelines Committee**
- External Communications

Players



- AWC
- PSRC
- **CRAB**
- FHWA
- WSDOT Design
- **WSDOT H&LP**
- WSDOT Traffic
- OTED
- **Pierce County**
- City of Seattle
- City of Bremerton
- City of Spokane

Project Overview



Safety & Aesthetics / Urban Design



- Management Team
 - Maintain Project Focus
 - Assure Representation
 - Recommendations to Executive Management
- Members
 - Al King, H&LP
 - Dave McCormick, NW Reg
 - Dick Albin, HQ Design
 - Don Petersen, FHWA
 - Elizabeth Robbins, H&LP
 - **Nancy Boyd, HQ Design**

Interdisciplinary Group

- Oversight to Various Efforts
- Develop Collaborative Recommendations



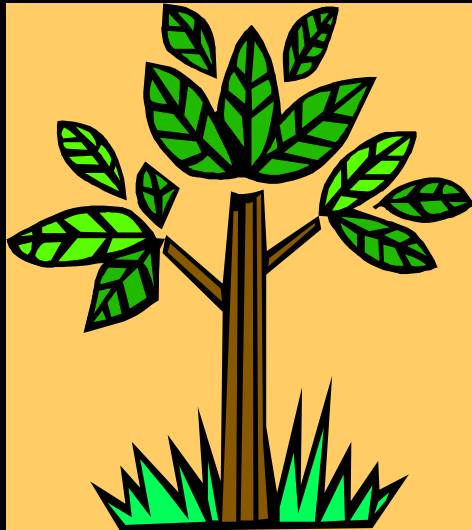
Interdisciplinary Group

- Nancy Boyd (lead)
- Al King
- Ashley Probart
- Ben Bakkenta
- Chris Mudgett
- Dave McCormick
- Dick Albin
- Don Petersen
- Elizabeth Robbins
- Jim Ellison
- Jim Morrow
- Jim Seitz
- Ken Brown
- Ken Miller
- Lynn Price
- Maiya Andrews
- Mark Maurer
- Mike Dornfeld
- Mike Johnson
- Paul Harker
- Rich Meredith
- Rocky Piro
- Sally Anderson
- Shane DeWald
- Shuming Yan
- Susan Kempf
- Tom Ballard
- Troy Cowan

Median Treatment Brochures

- Purpose

- Provide Graphic Options



- Members

- Mark Maurer, HQ Landscape
- Fred Wepfer, HQ Landscape
- Nancy Boyd, HQ Design

In-Service Evaluation

- Recognize Community Desire for Street Trees
- Consider Impacts of Approved Trees in Clear Zone
- Develop Collaborative Programs for Evaluation
- Consider Additional Research Needs



In-Service Evaluation



- **Dave McCormick** • Working Individually with Affected Agencies on State Highways
- **(lead)**
- Nancy Boyd
- Mark Leth
- Mark Bandy • Consider Other Local Facilities Later
- Tom Gut
- Maiya Andrews
- Ken Miller

Pedestrian Facilities

- Purpose
 - Issues on Pedestrian Facilities along State Highways
- Members
 - John Milton (lead)
 - TBD



Design Manual Revisions

- Purpose

- Design Manual Changes Coming
- Work with Affected Local Agencies



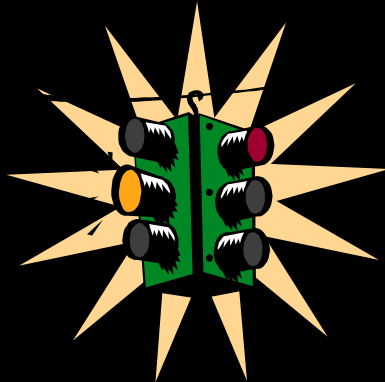
- Members

- Nancy Boyd (lead)
- Ted Focke
- Larry Hinson
- Dave Olson
- Paul Harker
- Mike Johnson
- Troy Cowan
- Mark Maurer
- Shane DeWald

Urban Roadside Funding

- Purpose

- Resolve WSDOT Inconsistencies
- Will Pay For What?
- At What Level?

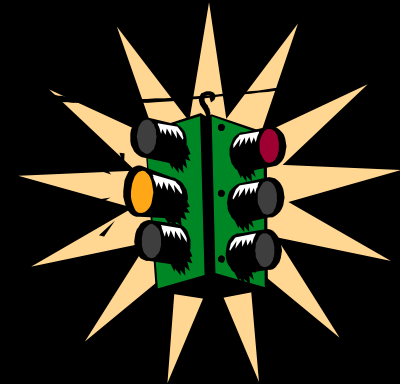


- Members

- Sally Anderson (lead)
- Al King
- Azim Sheik-Tehari
- Dennis Ritter
- Elizabeth Robbins
- Mark Maurer
- Nancy Boyd
- Pat Morin

Training

- Purpose
 - Develop Internal WSDOT Training for Results
 - Work w/ TranSpeed to CSD Course
- Members
 - **Nancy Boyd**



Clear Zone Task Group

- AASHTO Changes
 - Includes Clear Zone
- Develop Compatible Design Options
 - WSDOT
 - Local Agency
- Minimize Impact
- Avoid Legislative “Solution”



Clear Zone Task Group



- **Dick Albin (lead)**
- Al King
- Ashley Probart
- Don Petersen
- Jim Morrow
- Jim Seitz
- Ken Brown
- Considering Additional City/County & APWA Members
- Passions Running High
- Looking to Educate AASHTO Effect
- Find Compromise to Deal with Competing Needs

Roadway Policy Development



- Sources of information include national guidance (such as FHWA and AASHTO), and research (internal, other states or universities, national)
- Implementation into the WSDOT Design Manual is reviewed by OSC Design and a draft is prepared. This draft is submitted for a statewide review and then to FHWA for approval.

WSDOT Policy Development



- The WSDOT Design Manual and the City/County Standards are the basis for our agreement with FHWA on how we will design our facilities
- While AASHTO is not a policy or standard, we need good reasons for developing policy that is different .

Local Agency Policy



- Use of the WSDOT Design Manual is required on all Federally funded projects and all projects on the NHS
- City/County Design Standards are required on all projects
- LAG provides project management direction

Guidance and Policy Review



- AASHTO “Green Book”
- AASHTO Roadside Design Guide
- WSDOT Design Manual
- City/County Design Standards

1990 AASHTO Green Book

(page 343-4)



- For urban arterials, collectors and local streets where curbs are utilized, space for clear zones is generally restricted.
- A minimum distance of 1.5 feet should be provided beyond the face of curb with wider clear zones provided where possible.
- Where shoulders are provided rather than curbs, a clear zone commensurate with rural conditions should be provided.

2001 AASHTO Green Book

(page 322-3)



- For urban arterials, collectors and local streets where curbs are utilized, space for clear zones is generally restricted.
- A minimum offset distance of 18 in should be provided beyond the face of curb with wider clear zones provided where practical.
- This “operational” offset will generally permit curbside parking and will not have a negative impact on traffic flow.

2001 AASHTO Green Book

(page 322-3) – continued



- However, since most curbs do not have a significant capability to redirect vehicles, a minimum clear zone distance commensurate with prevailing traffic volumes and vehicle speeds should be provided where practical.

1996 AASHTO Roadside Design Guide (Page 3-16)



- In urban conditions, a minimum horizontal clearance of 0.5 m should be provided beyond the face of curb

2001 AASHTO Roadside Design Guide (Page 3-12)



- When obstructions exist behind curbs, a minimum horizontal clearance of 1.5 ft should be provided beyond the face of curb to the obstruction.
- This offset may be considered the minimum allowable horizontal clearance (or operational offset), but it should not be construed as an acceptable clear zone distance.

2001 AASHTO Roadside Design Guide (Page 3-12) continued



- Since curbs do not have significant redirection capability, obstructions behind a curb should be located at or beyond the minimum clear zone distances...
- In most instances this will not be feasible to obtain the recommended clear zone distances on existing facilities.

2001 AASHTO Roadside Design Guide (Page 10-2)



- While the clear roadside concept is still the goal of the designer, there are likely to be many compromises in the urban or suburban area
- One misconception is that a curb with a 1.5 ft offset behind it satisfies the clear roadside concept.
- Realistically, curbs have limited redirection capabilities and only at low speeds, approximately 25 mph or lower.

2001 AASHTO Roadside Design Guide (Page 10-2) continued



- Consequently, regardless of curbing, the designer must strive for a wider clear zone that is more reflective of the off-peak operating speed (85th percentile) or design speed whichever is higher.

WSDOT Design Manual (page 700-2)

- The Clear zone is a primary consideration when analyzing hazards.
- The intent is to provide as much clear, traversable recovery area as practical.
- The Design Clear Zone values shown in Figure 700-1 are used to judge the adequacy of the existing clear zone and to provide a minimum target value for highway design.

WSDOT Design Manual (page 700-2)



- These values are not to be used as justification to compromise or take away from the existing clear zone.

City/County Design Standards

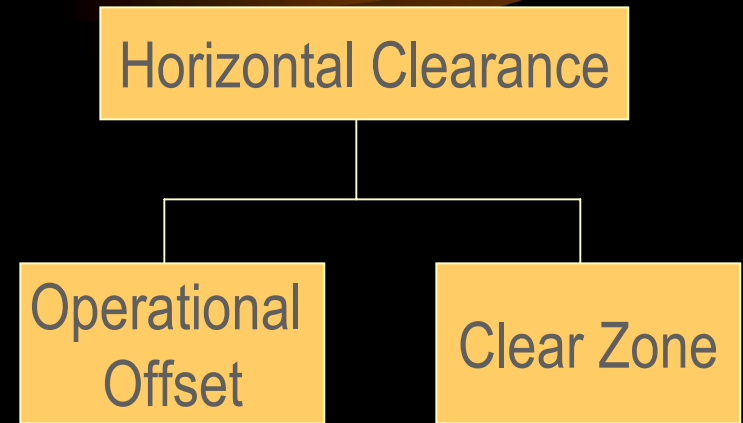
(Page 9)



- Refers to AASHTO or TRB Special Report 214

Review previous meeting discussions

- The 2001 AASHTO Green Book and Roadside Design Guide continue to acknowledge the restricted environment in urban areas. However, the changes clarified the intent of the “operational offset” and avoided the reference to this offset as a clear zone. It also encourages providing wider clear zones where practical.



Strategy/Action:



The following is the strategy that the group agreed would be acceptable:

- The WSDOT should clarify the clear zone policy.
- The policy should resemble that language in AASHTO Roadside Design Guide
- The policy would focus on facilities with posted speeds of 35 mph or less

Strategy/Action: (continued)

- This would require the clear zone to be established and justified on a project by project basis or functional use basis rather than an relying on an operational offset.
- The clear zone distances on Design Manual figure 700-1 should be revised to be consistent with AASHTO Table 3.1
- Clarification of issues such as parking, curbing and the appropriate location to begin measuring the clear zone (edge of traveled way) should be included.

Strategy/Action: (continued)

- The policy should clarify the distinction between evaluating an existing clear zone and adding new objects
- A draft Design Manual Supplement will be sent out to the task Group for review. It will then be sent out for a statewide review and then to FHWA for approval.
- The Task group agreed to this approach but it was recognized that agencies that were not in attendance may need some explanations when it is sent out for review.

Related issues



- Jurisdictional Authority
 - The jurisdictional authority issue can affect many things other than clear zone.
 - It is desirable to develop a policy that can be applied regardless of the jurisdictional authority.
- Other Issues

Overview of direction of Design Manual Supplement



- Recognize that there needs to be some flexibility in the establishment of clear zones in urban areas
- Allows the clear zone to be established based on a corridor or project analysis for urban streets with posted speeds of 35 mph or less

Elements proposed for change in the WSDOT Design Manual

- Based on input from local agency participants in the “Safety and Aesthetics in Urban Roadway Design” Interdisciplinary Group
- Arterial HOV lanes: Should HOV lanes be considered part of clear zone depending on operational characteristics during off-peak periods
- Shoulder Offsets widths: Should the minimum shoulder width be reduced from 4’ to 3’. What are the impacts to bike, pedestrian and vehicle traffic.

Jurisdictional Responsibilities

- Cities Over 22,500 Population
- RCW 47.24.020
- Inside & Outside Curb
- Goal Mutually Acceptable Solution
- Impacted by Applicable Design Standards



Jurisdictional Responsibilities

- **John Milton (lead)**
- Al King
- Dan Sarles
- Dave McCormick
- Elizabeth Robbins
- Pat Morin
- Terry Paananen
- First Resolve WSDOT Position
- Work with Local Agency Reps to Resolve Differences
- Will Need to Add Local Reps

Contacts for Safety and Aesthetics



- Nancy Boyd
 - boydn@wsdot.wa.gov
- John Milton
 - miltonj@wsdot.wa.gov
- Website
 - <http://www.wsdot.wa.gov/eesc/design/policy/SafetyResearch/UrbanDesign/Default.htm>

Questions?

- Please ask!

